

1. This table shows the names of students in Mr. Leary's class who do or do not own bicycles and skateboards.

A B (A ∩ B) (A ∪ B)'

Bicycle and Skateboard Ownership			
Owns a Bicycle	Owns a Skateboard	Owns a Bicycle AND Skateboard	Does NOT Own a Bicycle OR Skateboard
Ryan	Brett	Joe	Amy
Sarah	Juan	Mike	Gabe
Mariko	Tobi	Linda	Abi
Nina		Rose	
Dion			

Let set A be the names of students who own bicycles, and let set B be the names of students who own skateboards.

- a. Find A and B. What does the set represent? $\frac{4}{13}$ {Joe, Mike, Linda, Rose}, owns a bicycle and a skateboard
- b. Find A or B. What does the set represent? $\frac{12}{13}$ {Ryan, Sarah, Mariko, Nina, Dion, Brett, Juan, Tobi}, own either one
- c. Find (A or B)'. What does the set represent? $\frac{1}{13}$ {Amy, Gabe, Abi}, does not own either one

2. In a certain town, the probability that a person plays sports is 65%. The probability that a person is between the ages of 12 and 18 is 40%. The probability that a person plays sports and is between the ages of 12 and 18 is 25%. Are the events independent? How do you know?

$P(A) = 0.65$ $P(B) = 0.40$ $P(A \cap B) = 0.25$ NOT Independent.
 $P(A) \cdot P(B) = P(A \cap B)$
 $0.65(0.4) = 0.26 \neq 0.25$ $P(A) \cdot P(B) \neq P(A \cap B)$

3. A random survey was conducted to gather information about age and employment status. This table shows the data that were collected.

Employment Survey Results

	Less than 18 years old	18 years old or greater	Total
Has Job	20	587	607
Does Not Have Job	245	92	337
Total	265	679	944

a. What is the probability that a randomly selected person surveyed has a job, given that the person is less than 18 years old?

$\frac{20}{265} = 0.075$

b. What is the probability that a randomly selected person surveyed has a job, given that the person is greater than or equal to 18 years old?

$\frac{587}{679} = 0.865$

c. Are having a job (A) and being 18 or greater (B) independent events? Explain.

- $P(A)$ = has a job $P(A) = \frac{607}{944}$
- $P(A')$ = does not have a job
- $P(B)$ = 18 years old or greater $P(B) = \frac{679}{944} = 0.72$
- $P(B')$ = less than 18 years old $P(A \cap B) = \frac{587}{944} = 0.6218$

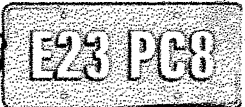



$P(A) \cdot P(B) = 0.4625$ $P(B|A) = \frac{587}{607} = 0.97$

$P(A|B) = \frac{587}{679} = 0.865$

NOT Independent
 $P(A|B) \neq P(A)$ and
 $P(B|A) \neq P(B)$

4. In a particular state, the first character on a license plate is always a letter. The last character is always a digit from 0 to 9. If V represents the set of all license plates beginning with a vowel, and O represents the set of all license plates that end with an odd number, which license plate belongs to the set V and O'?

Begins with vowel and does not end in odd number

A.    

(Note: The license plate AR8 8X9 is crossed out with an X, and the license plate P7M Z56 is also crossed out with an X.)

5. For which set of probabilities would events A and B be independent?

- A. $P(A) = 0.25$; $P(B) = 0.25$; $P(A \text{ and } B) = 0.5$
- B. $P(A) = 0.08$; $P(B) = 0.4$; $P(A \text{ and } B) = 0.12$
- C. $P(A) = 0.16$; $P(B) = 0.24$; $P(A \text{ and } B) = 0.32$
- D. $P(A) = 0.3$; $P(B) = 0.15$; $P(A \text{ and } B) = 0.045$**

6. Assume that the following events are independent:

- $P(A)$ The probability that a high school senior will go to college is 0.72.
- $P(A \cap B)$ The probability that a high school senior will go to college and live on campus is 0.46.

$$P(A \cap B) = P(A) \cdot P(B|A)$$

$$0.46 = 0.72 \cdot P(B|A)$$

$$P(B|A) = \frac{0.46}{0.72}$$

What is the probability that a high school senior will live on campus, given that the person will go to college?

- A. 0.26
- B. 0.33
- C. 0.57
- D. 0.64**

7. A random survey was conducted about gender and hair color. This table records the data.

	Hair Color			
	Black	Brown	Blonde	Other
Male	548	876	82	1,506
Female	612	716	66	1,394
Total	1,160	1,592	148	2,900

$$\frac{876}{1506} = 0.58$$

What is the probability that a randomly selected person has blonde hair, given that the person selected is male?

- A. 0.51
- B. 0.55
- C. 0.58**
- D. 0.63